

## **CONVERTIBLE ENCLOSURE FOR SPAS**

### **Technical Field**

[0001] The present invention relates generally to a spa enclosure and more particularly to a convertible enclosure for use over a hot tub, spa, and the like.

### **Background of the Invention**

[0002] Hot tubs and/or spas typically utilized in the outside environment of a residential home contain heated water often circulated with numerous jets, and air bubblers that sooth and relax the bather. The inside liner of the tubs and spas typically form seats or lounging areas wherein the jets are strategically placed to massage specific areas of the bather. Because the spa is often located outside, it is exposed to seasonal weather changes which can be considerably colder than the heated temperature of the spa water. Consequently, cumbersome insulated covers are placed directly over the spa to minimize heat loss, preserve energy, and prevent water evaporation.

[0003] The weight and size of the insulated covers can create cover removal and placement difficulty for the bather. Consequently, cover removal devices are known which minimize the required lifting effort by the bather. One such device is disclosed in Perry, U.S. Patent 4,853,985, filed March 31, 1988, and in Tudor, U.S. Patent 5,974,599, filed January 9, 1998, both being incorporated herein by reference.

[0004] Unfortunately, once the cover is removed and the bather(s) are relaxing within the hot tub or spa, the degree of privacy for the outdoor bather(s) is greatly minimized. Moreover, the bather when in the spa may be exposed to the harsh rays of the sun or bothered by surrounding insects and overhead birds. Yet further, falling debris from surrounding trees can clog the spa filter.

### **Summary of the Invention**

[0005] A convertible enclosure for a hot tub or spa has an overhead canopy stretched between a pair of whip devices. Each whip device has a hollow base tube engaged longitudinally along a substantially vertical shaft disposed substantially near the rear corners of the spa. A flex rod of the whip device seats within, and projects substantially upward from, the tube yieldably bending forward toward respective forward corners of the spa. A pair of elongated fasteners engaged to respective forward corners of the spa extend upward to engage the distal ends of the rods. Preferably, the tubes are free to slide circumferentially with respect to the shafts and in opposite generally outward directions, enabling a consistent tension to be exerted upon the canopy.

[0006] Preferably, the shafts are an integral part of a spa cover removal mechanism attached permanently to the base tubes. The rods are removable from the tubes for disassembly of the convertible enclosure. When assembled, the enclosure preferably has an elongated cross member engaged between the distal ends of the rods and at least one vertical spacer bar engaged between the spa and the overhead cross member to further stabilize the canopy.

[0007] Objects, features and advantages of this invention include a relatively inexpensive, robust, light weight and easily assembled enclosure for a hot tub which utilizes pre-existing structure of a cover removal mechanism. Moreover, the convertible enclosure is resistant to corrosion and moisture, capable of maintaining a taught canopy in changing weather conditions, protects the bather from harmful ultraviolet rays of the sun, provides bathing privacy, and is easily disassembled.

### **Brief Description of the Drawings**

[0008] These and other objects, features and advantages of this invention will be apparent from the following detailed description of the preferred embodiment and best mode, appended claims, and accompanying drawings in which:

[0009] Figure 1 is a forward perspective view of a convertible awning of the present invention utilized on a spa in conjunction with a cover removal mechanism;

[0010] Figure 2 is a rearward perspective view of the convertible awning;

[0011] Figure 3 is a side view of the convertible awning;

[0012] Figure 4 is a partial enlarged view of the convertible awning engaged to the cover removal mechanism;

[0013] Figure 5 is a cross section of a first and second whip device of the convertible awning shown in a stretched position and taken along line 5-5 of Figure 3;

[0014] Figure 6 is an enlarged partial perspective view of the convertible awning illustrating engagement of fasteners and vertical spacer bars;

[0015] Figure 7 is an enlarged partial front view of the convertible awning detailing engagement of the spacer bar to a cross member of the convertible awning;

[0016] Figure 8 is a cross section of the engagement of the spacer bar to the cross member taken along line 8-8 of Figure 7; and

[0017] Figure 9 is a cross section of a base tube engaged to a shaft of the convertible awning with a flex rod removed to show internal detail, and taken along line 9-9 of Figure 4.

### **Detailed Description of the Preferred Embodiments**

[0018] Referring to Figures 1-4, a convertible awning or enclosure 20 of the present invention is integrated with a spa cover removal mechanism 22. One form of the spa

cover removal mechanism 22, described in U.S. Patent 5,974,599, filed January 9, 1998 and incorporated herein by reference, has a generally inverted U-shaped frame 24 capable of lifting and suspending the weight of a folding spa cover 34. The frame has a substantially horizontal portion 26 engaged between two generally vertical and downward projecting shafts 28, 30. The horizontal portion 26 extends across the width of, and is engaged to, a mid-section 32 of the folding spa cover 34. The shafts 28, 30 are generally L-shaped having lower end portions 36 engaged to respective left and right sides 38, 40 of the spa 42, or substantially near to the spa sides 38, 40, and slightly forward of the respective left and right rear corners 44, 46 of the spa 42.

[0019] When the spa cover 34 is in an installed or closed position (not shown), the open perspective of the pivoting L-shaped shafts 28, 30 are opened generally in a forward and downward direction. As the spa cover removal mechanism 22 pivots toward a removed or open position 48, the horizontal portion 26 lifts the mid-section 32 of the cover 34 upward and rearward causing the cover 34 to fold upon itself and re-position adjacent to a rear side 50 of the spa 42, thus designating the fully open position 48 of the cover removal mechanism 22. When the spa cover 34 is in the open position 48, the open perspective of the L-shaped shafts 28, 30 are directed in a slightly upward and substantially forward direction. Thus, a substantially vertical and straight upper portion 52 of the shafts 28, 30 project upward at a slightly rearward angle to form into the horizontal portion 26, and a substantially shorter horizontal lower portion 54 projects forward to a common pivoting axis 56.

[0020] Referring to Figures 3-6, the convertible awning 20 is integrated with the cover removal mechanism 22 via a pair of bases or hollow tubes 58, 60 engaged to and co-extending with the straight upper portions 52 of the shafts 28, 30. When the cover removal mechanism 22 is in the closed position, only the tubes 58, 60 of the

convertible awning 20 are assembled to the removal mechanism 22. However, when the removal mechanism 22 is in the open position 48, the convertible awning 20 can then be easily and fully assembled. Moreover, by securing the hollow tubes directly to the surrounding ground or opposite sides 38, 40 of the spa 42, the convertible awning 20 can be used separate from the cover removal mechanism 22 enabling assembly of the awning regardless of the spa cover 34 position.

[0021] The left and right base tubes 58, 60 are part of respective left and right flexible whip devices 62, 64, which support an overhead canopy 65. Each device has an elongated flex rod 66, 68 extending between a preferably cylindrical base end 70, seated axially or longitudinally into the hollow base tubes 58, 60, and a distal end 72 spaced above respective left and right forward corners 74, 76 of the spa 42. The rods 66, 68 project substantially upward from the tubes and bend resiliently over the spa 42 toward the forward corners 74, 76. A rigid elongated cross member 78 (as best shown in Figures 6-8) extends between and engages to the two distal ends 72 maintaining a predefined space between the rods 66, 68. Preferably, the ends 72 of the rigid cross member 78 engage the respective distal ends 72 of the rods 66, 68 via respective plastic ninety degree fittings or elbows 80. The cloth-like canopy 65 is stretched over the spa 42 and has a sleeve-like periphery 82 which receives the rods 66, 68 and cross member 78 or otherwise is engaged generally continuously along the rods and the rigid cross member.

[0022] The flexed condition of the resilient rods 66, 68 is held in place by two respective elongated fasteners or resiliently stretchable cords 84, 86 which are engaged substantially near the forward corners 74, 76 of the spa 42 and the distal ends 72 of the flexed rods 66, 68. The fasteners 84, 86 are thus disposed under tension by the upward and rearward resilient force of the biased flex rods 66, 68.

[0023] Referring to Figures 6-8, the canopy 65 and flex rods 66, 68 are further stabilized by substantially vertical left and right spacer bars 88, 90 engaged between respective forward corners 74, 76 of the spa 42 and opposite ends 92, 94 of the cross member 78 near the distal ends 72 of the left and right flex rods 66, 68. Releasable engagement of a bar bottom end 96 to the spa 42 is preferably achieved by suction cups 98 attached permanently to the bar 88, 90. A concave top end 100 of the bar 88, 90 is engaged to the cross member 78 via a fastener or plastic tie wrap 102 routed through a hole 104 communicating laterally through the bar 88, 90, and encircling the cross member 78 (as best shown in Figure 8).

[0024] Referring to Figures 5 and 9, the rods 66, 68 are held snugly within the tubes 58, 60 by friction inducing sleeves or sheets 106, 108 which are preferably made of a flexible plastic having a knurled or dimpled surface and are rolled and placed into the base tubes 58, 60. When the rods 66, 68 are seated axially into the tubes 58, 60 the rolled sheets 106, 108 are disposed radially between the respective rod and the tube.

[0025] Referring to Figure 2, the rigidity of the assembled flex rods 66, 68, cross member 78 and vertical spacer bars 88, 90 provide an ideal support structure for a surrounding screen or window-like enclosure 110 having a left panel draped downward from the left rod 66, a right panel 111 draped downward from the right rod 68 and a forward panel draped downward from the cross member 78. A rear panel is not required because of the curved orientation of the canopy 65 and flexed rods 66, 68 which slope downward toward the spa 42 and folded cover 34, thus providing a degree of privacy. Preferably, the panels are releasably attached to the canopy 65 by velcro.

[0026] Referring to Figure 5, the canopy 65 is pulled taught in a lateral direction with respect to the left and right flex rods 66, 68 and as designated by arrows 112. This lateral pull is created by the tendency of the left tube 58 to slide circumferentially counter-clockwise with respect to the left shaft 28 (as designated by arrow 114) and the right tube 60 to slide circumferentially clock-wise with respect to the right shaft 30 (as designated by arrow 116). The circumferential slide of the tubes 58, 60 is induced by the forward flexing of the rods 66, 68 and the forward pull upon the whip devices 62, 64 created by the preferably bungee-type cords 84, 86.

[0027] During assembly of the convertible awning 20, positioning of the left tube 58 in a slightly less than twelve-noon position with respect to the left shaft 28, and the right tube 60 in a slightly greater than twelve-noon position with respect to the right shaft 30 not only assures the proper directions of circumferential slide 114, 116 to pull the canopy 65 taught, but also causes the flex rods 66, 68 to clear the U-shaped frame 24 when flexing forward (as best shown in Figures 3 and 4).

[0028] Further pulling the canopy 65 taught in a lateral direction with respect to the flex rods 66, 68 are a series of elongated spacer bows or spreader tubes 126. Each tube 126 extends laterally between the rods 66, 68 and are appropriately spaced apart from one-another to shape or contour the canopy 65 as needed to reflect or drain-off rain water and provide a pleasing wrinkle-free appearance to the canopy. Each spreader tube 126 is slightly longer than the distance between the rods 66, 68 thus creating the bow effect and maintaining the canopy 65 under a constant tension. T-shaped end portions of each spreader tube 126 are contoured, thus having a C-shaped cross section, which snugly fit and partially wrap about the cylindrical contour of each rod 66, 68. When assembling the convertible awning 20, the spreader tubes 126 are preferably installed last or after the rods 66, 68 are in position. To install, the user

applies a force to resiliently bend the tube 126 generally at the middle to slip the tube between the rods 66, 68. Release of this force causes the tube 126 to partially and resiliently flex back until the T-shaped end portions snugly fit or lock to the rods 66, 68. During disassembly of the convertible awning 20, re-applying the flexing force to the spreader tubes 126 will release the tubes from the flex rods 66, 68.

[0029] A series of axially spaced fastening bands or plastic tie wraps 118 hold the tubes 58, 60 laterally against the shafts 28, 30, thus resisting the tendency of the base ends 70 of the rods 66, 68 to move rearward when the rods are flexed forward. Longitudinal skewing of the tubes 66, 68 with respect to the shafts 28, 30 is prevented by a contoured outer circumferential face 120 of the tubes which defines a longitudinally extending recess 122 having a radius of curvature which substantially conforms to the radius of the shafts 28, 30. The face 120 of the tubes 58, 60 thus slideably seats to an opposing circular surface 124 of the shafts 28, 30 at the recesses 122.

[0030] Referring to Figures 1 and 2, further supporting the canopy 65 are two substantially parallel spacer bows or elongated spreader tubes 126 which extend between and engage to the left and right rods 66, 68. Preferably, the bows 126 are disposed substantially perpendicular to the rods 66, 68 and are slightly longer than the distance between the rods, thus bending in a resilient bow-like fashion pushing the rods 66, 68 laterally apart, assisting in the circumferential movement of the tubes 58, 60, pushing upward or outward upon the canopy, and further causing the canopy to remain taught.

[0031] Referring to Figure 4, travel of the U-shaped frame of the cover lifting mechanism 22 is limited by a pair of steel cables or tethers 128 secured between the respective sides 38, 40 of the spa 42 and the straight upper portions 52 of the shafts



28, 30 (see U.S. Patent 6,158,063, incorporated herein by reference for further detail). The tethers have a loop 130 which wraps securely about the shafts 28, 30. Preferably, the integrated convertible awning 20 utilizes the loops 130 as a type of circumferential rib to prevent axial movement of the tubes 58, 60 with respect to the shafts 28, 30. Each tube carries a lateral outward groove 132 which seats the respective loops 130 of the tethers 128. Axial movement of the rods 66, 68 with respect to the tubes 58, 60 is prevented once assembled by a plug 134 engaged to the base end 70 of each tube 58, 60. Preferably, the plug 134 is threaded into the end of the tube, however, it may also be molded as a unitary piece with the tube, or secured in other ways such as adhesive. To prevent water from settling within the tubes 58, 60 when the convertible enclosure 20 is disassembled, each plug 134 preferably carries a hole (not shown) for water drainage. Keeping the tubes 58, 60 free of pooled water assures that freezing water will not damage the tubes during cold weather.

[0032] Preferably, the tubes 58, 60, cross member 78, spacer bars 88, 90, rods 66, 68 and bows 126 are made of a non-corrosive, water resistant, plastic, such as PVC or CPVC piping. The rods 66, 68 and bows 126 are appropriately sized to possess a substantial degree of flexibility and may also be made of fiberglass or other materials, solid or otherwise. The fasteners 84, 86 are preferably elastic bungee cords or straps attached permanently to the distal ends 72 of the rods 66, 68. Each cord 84, 86 has an enlarged upper end or knot 139 (as best shown in FIG. 7) preferably disposed concealably inside the distal ends 72 of the hollow rods 66, 68. From the enlarged head, each cord 84, 86 generally projects downward and snugly through a hole in the pipe wall of the rods 66, 68 to removably engage a peripheral lip 138 of the hot tub 42 via rubber-coated steel hooks 136 connected to the lower cord ends.

[0033] Referring to Figures 6 and 7, the forward portion of the convertible enclosure 20 is stabilized laterally by two angled flexibly braces 140 which extend between and snap fit to the cross member 78 and respective spacer bars 88, 90. Each brace 140 has chamfered end faces 142 which conform to the contour of the cylindrical surface of the bars 88, 90 and cross member 78. Projecting axially outward from each face 142 is a pin 144 that snap fits into a corresponding hole 146 carried by the walls of the cross member 78 and spacer bars 88, 90.

[0034] While the forms of the invention herein disclosed constitute a presently preferred embodiment, many others are possible. It is not intended herein to mention all the possible equivalent forms or ramifications of the invention. It is understood that terms used herein are merely descriptive, rather than limiting, and that various changes may be made without departing from the spirit or scope of the invention as defined by the following claims.